

9622

DUAL LINE RECEIVER

A FAIRCHILD COMPATIBLE CURRENT SINKING LOGIC PRODUCT

GENERAL DESCRIPTION — The 9622 is a dual line receiver designed to discriminate a worst case logic swing of 2 volts from a ± 10 volt common mode noise signal or ground shift. A 1.5 volt threshold is built into the differential amplifier to offer a CCSL compatible threshold voltage and maximum noise immunity. The offset is obtained by use of current sources and matched resistors and varies only $\pm 5\%$ (75 mV) over the military and industrial temperature ranges.

The 9622 allows the choice of output states with the inputs open without affecting circuit performance by use of S3. A $130\ \Omega$ terminating resistor is provided at the input of the each line receiver. An enable is also provided for each line receiver. The output is CCSL compatible. The output high level can be increased to $+12\text{ V}$ by tying it to a positive supply through a resistor. The outputs can be wire-OR'ed.

FEATURES:

- CCSL COMPATIBLE THRESHOLD VOLTAGE
- INPUT TERMINATING RESISTORS
- CHOICE OF OUTPUT STATE WITH INPUTS OPEN
- CCSL COMPATIBLE OUTPUT
- HIGH COMMON MODE
- WIRE-OR CAPABILITY
- ENABLE INPUTS
- FULL MILITARY TEMPERATURE RANGE
- LOGIC COMPATIBLE SUPPLY VOLTAGES

ABSOLUTE MAXIMUM RATINGS (above which the useful life may be impaired)

Storage Temperature
 Temperature (Ambient) Under Bias
 V_{CC1} Pin Potential to Ground Pin
 Input Voltage
 Voltage Applied to Outputs for High Output State
 V_{EE} Pin Potential to Ground Pin
 Enable Pin Potential to Ground Pin

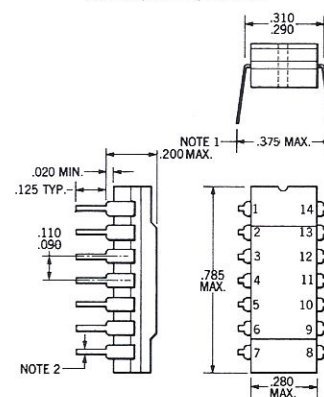
-65°C to $+150^\circ\text{C}$
 -55°C to $+125^\circ\text{C}$
 -0.5 V to $+7\text{ V}$
 $\pm 15\text{ V}$
 -0.5 V to $+13.2\text{ V}$
 -0.5 V to -12 V
 -0.5 V to $+15\text{ V}$

ORDER INFORMATION

Specify U6A9622XXX for 14 pin Dual In-Line package, U3I9622XXX for 14 pin Flat package where XXX is 51X for the -55°C to $+125^\circ\text{C}$ temperature range, or 59X for the 0°C to $+75^\circ\text{C}$ temperature range.

TYPICAL DUAL IN-LINE PACKAGE

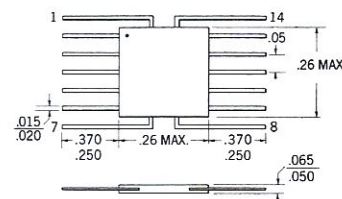
In Accordance With
JEDEC (TO-116) Outline



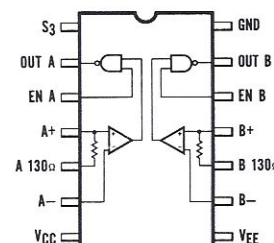
NOTES:

1. Leads are intended for insertion in hole rows on .300" centers. They are purposely shipped with "positive" (.375) misalignment to facilitate insertion.
2. Board drilling dimensions should equal your practice for a conventional .020 inch diameter lead.

FLAT PACKAGE TOP VIEW



LOGIC DIAGRAM



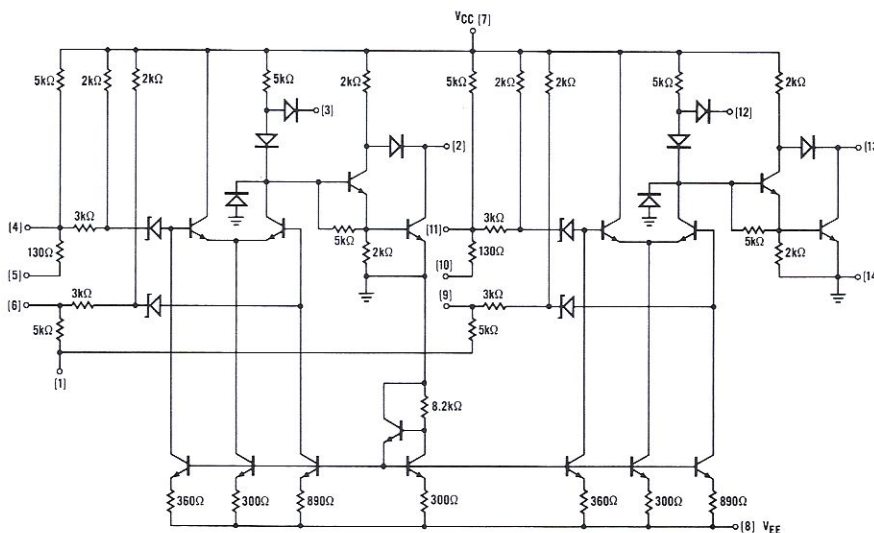
FAIRCHILD DUAL LINE RECEIVER • 9622

ELECTRICAL CHARACTERISTICS (Temperature Range -55°C to $+125^{\circ}\text{C}$, $V_{CC} = 5.0\text{ V} \pm 10\%$, $V_{EE} = -10\text{ V} \pm 10\%$) (Part No. UXX962251X)

SYMBOL	CHARACTERISTICS	LIMITS						UNITS	CONDITIONS & COMMENTS	
		-55°C		+25°C		+125°C				
		MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.		
V _{OL}	Output Low Voltage		0.40		0.25	0.40		0.40	V	V _{CC} = 4.5 V *V _{DIFF} = 2.0 V V _{EE} = -11 V I _{OL} = 12.4 mA
V _{OH}	Output High Voltage	2.8		3.0	3.3		2.9		V	V _{CC} = 4.5 V *V _{DIFF} = 1.0 V V _{EE} = -9.0 V I _{OH} = -0.2 mA
I _{CEX}	Output Leakage Current		50			100		200	μA	V _{CC} = 4.5 V *V _{DIFF} = 1.0 V V _{EE} = -11 V V _{CEX} = 12 V
I _{SC}	Output Shorted Current	-1.3	-3.1	-1.4	-2.15	-3.1	-1.3	-3.1	mA	V _{CC} = 5.0 V *V _{DIFF} = 1.0 V V _{EE} = -10 V V _{SC} = 0 V
I _{R(ENABLE)}	Enable Input Leakage Current					2.0		5.0	μA	V _{CC} = 4.5 V S ₃ = 4.5 V V _{EE} = -11 V V _R = 4.0 V
I _{F(ENABLE)}	Enable Input Forward Current		-1.5		-0.96	-1.5		-1.5	mA	V _{CC} = 5.5 V S ₃ = 0 V V _{EE} = -9.0 V V _F = 0 V
I _{F(+Input)}	+ Input Forward Current		-2.3		-1.67	-2.1		-2.0	mA	V _{CC} = 5.0 V - Input = Gnd V _{EE} = -10 V V _F = 0 V
I _{F(-Input)}	- Input Forward Current		-2.6		-1.87	-2.4		-2.3	mA	V _{CC} , S ₃ = 5.0 V + Input = Gnd V _{EE} = -10 V V _F = 0 V
V _{IL(ENABLE)}	Input Low Voltage		1.3		1.4	1.0		0.7	V	V _{CC} = 5.0 V ±10% V _{EE} = -10 V ±10%
V _{th}	Differential Input Threshold Voltage	1.0	2.0	1.0	1.5	2.0	1.0	2.0	V	V _{CC} = 5.0 V ±10% V _{EE} = -10 V ±10%
V _{CM}	Common Mode Voltage			-10	±12	+10			V	V _{CC} = 5.0 V *V _{DIFF} = 1.0 V or 2.0 V V _{EE} = -10 V
R _{130Ω}	Terminating Resistance			100	130	175			Ω	
I _{CC}	5 V Supply Current				13.7	22.9			mA	V _{CC} = 5.5 V S ₃ , + Inputs = 5.5 V, - Inputs = 0 V V _{EE} = -11 V
I _{EE}	-10 V Supply Current				-6.5	-11.1			mA	V _{CC} = 5.5 V S ₃ , + Inputs = 5.5 V, - Inputs = 0 V V _{EE} = -11 V
t _{pd+}	Turn-off Time				38	50			ns	V _{CC} = 5.0 V V _{IN} 0→3 V, R _L = 3.9 kΩ, C _L = 30 pF V _{EE} = -10 V
t _{pd-}	Turn-on Time				35	50			ns	V _{CC} = 5.0 V V _{IN} 0→3.0 V, R _L = 0.39 kΩ, C _L = 30 pF V _{EE} = -10 V

V_{DIFF} is a differential input voltage referred from A+ to A- and from B+ to B-.

**SCHEMATIC DIAGRAM
(LINE RECEIVER)**



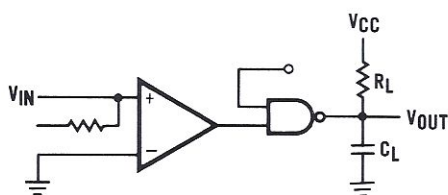
FAIRCHILD DUAL LINE RECEIVER • 9622

ELECTRICAL CHARACTERISTICS (Temperature Range 0°C to +75°C, $V_{CC} = 5.0 \text{ V} \pm 5\%$, $V_{EE} = -10 \text{ V} \pm 5\%$) (Part No. UXX962259X)

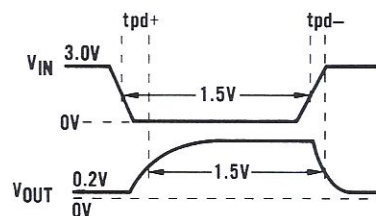
SYMBOL	CHARACTERISTICS	LIMITS						UNITS	CONDITIONS & COMMENTS	
		0°C		+25°C		+75°C				
		MIN.	MAX.	MIN.	TYP.	MAX.	MIN.	MAX.		
V _{OL}	Output Low Voltage		0.45		0.25	0.45		0.45	V	V _{CC} = 4.75 V *V _{DIFF} = 2.0 V V _{EE} = −10.5 V I _{OL} = 14.1 mA
V _{OH}	Output High Voltage	2.9		3.0	3.3		2.9		V	V _{CC} = 4.75 V *V _{DIFF} = 1.0 V V _{EE} = −9.5 V I _{OH} = −0.2 mA
I _{CEX}	Output Leakage Current		80			100		200	μA	V _{CC} = 4.75 V *V _{DIFF} = 1.0 V V _{EE} = −10.5 V V _{CEX} = 5.25 V
I _{SC}	Output Shorted Current	−1.3	−3.1	−1.4	−2.15	−3.2	−1.3	−3.1	mA	V _{CC} = 5.0 V *V _{DIFF} = 1.0 V V _{EE} = −10 V V _{SC} = 0 V
I _{R(ENABLE)}	Enable Input Leakage Current					5		10	μA	V _{CC} = 4.75 V S ₃ = 4.75 V V _{EE} = −10.5 V V _R = 4.0 V
I _{F(ENABLE)}	Enable Input Forward Current		−1.5		−.96	−1.5		−1.5	mA	V _{CC} = 5.25 V S ₃ = 0 V V _{EE} = −9.5 V V _F = 0 V
I _{F(+ Input)}	+ Input Forward Current		−2.6		−1.67	−2.4		−2.3	mA	V _{CC} = 5.0 V − Input = Gnd V _{EE} = −10 V V _F = 0 V
I _{F(− Input)}	− Input Forward Current		−2.9		−1.87	−2.7		−2.6	mA	V _{CC} , S ₃ = 5.0 V + Input = Gnd V _{EE} = −10 V V _F = 0 V
V _{IL(ENABLE)}	Input Low Voltage		1.2		1.4	1.0		0.85	V	V _{CC} = 5.0 V ±5% V _{EE} = −10 V ±5%
V _{th}	Differential Input Threshold Voltage	1.0	2.0	1.0	1.5	2.0	1.0	2.0	V	V _{CC} = 5.0 V ±5% V _{EE} = −10 V ±5%
V _{CM}	Common Mode Voltage			−7.5	±12	+7.5			V	V _{CC} = 5.0 V *V _{DIFF} = 1.0 V or 2.0 V V _{EE} = −10 V
R _{130Ω}	Terminating Resistance			91	130	185			Ω	
I _{CC}	5 V Supply Current				13.7	22.9			mA	V _{CC} = 5.25 V S ₃ , +Inputs = 5.25 V, −Inputs = 0 V V _{EE} = −10.5 V
I _{EE}	−10 V Supply Current				−6.5	−11.1			mA	V _{CC} = 5.25 V S ₃ , +Inputs = 5.25 V, −Inputs = 0 V V _{EE} = −10.5 V
t _{pd+}	Turn-off Time				38	100			ns	V _{CC} = 5.0 V V _{IN} 0→3.0 V, R _L = 3.9 kΩ, C _L = 30 pF V _{EE} = −10 V
t _{pd−}	Turn-on Time				35	100			ns	V _{CC} = 5.0 V V _{IN} 0→3.0 V, R _L = 0.39 kΩ, C _L = 30 pF V _{EE} = −10 V

$^*V_{DIFF}$ is a differential input voltage referred from A+ to A- and from B+ to B-.

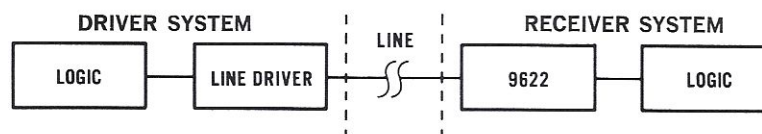
SWITCHING TIME TEST CIRCUIT



WAVEFORMS

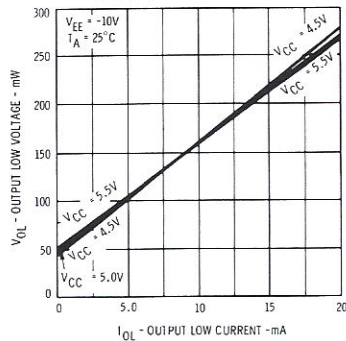


STANDARD USAGE

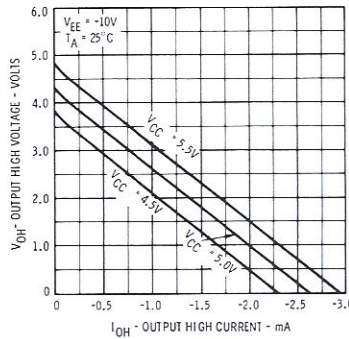


TYPICAL ELECTRICAL CHARACTERISTICS

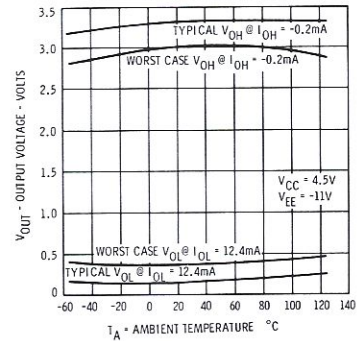
TYPICAL OUTPUT LOW VOLTAGE VERSUS OUTPUT LOW CURRENT



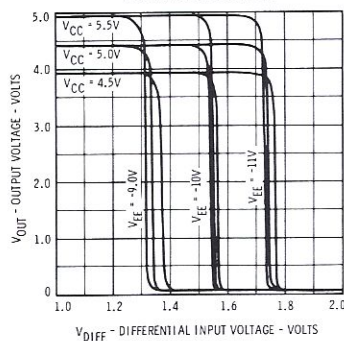
TYPICAL OUTPUT HIGH VOLTAGE VERSUS OUTPUT HIGH CURRENT



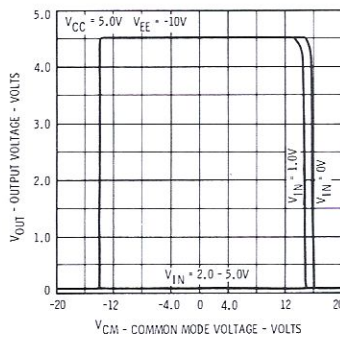
LOGIC LEVELS VERSUS AMBIENT TEMPERATURE



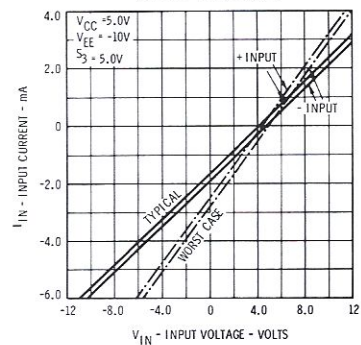
TYPICAL $V_{out} - V_{DIFF}$ TRANSFER CHARACTERISTICS



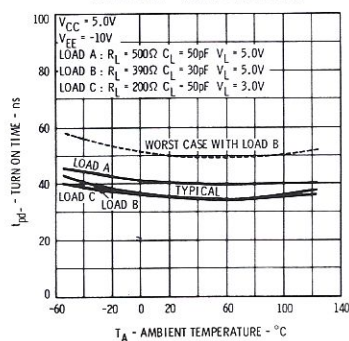
TYPICAL OUTPUT VOLTAGE VERSUS COMMON MODE VOLTAGE



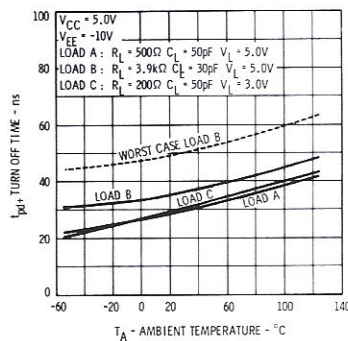
INPUT CURRENT VERSUS INPUT VOLTAGE



TURN ON TIME VERSUS AMBIENT TEMPERATURE



TURN OFF TIME VERSUS AMBIENT TEMPERATURE



POWER DISSIPATION VERSUS AMBIENT TEMPERATURE

